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Wellbeing-enhancing occupation and organizational and environmental contributors in long-term dementia care facilities: an explorative study

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ABSTRACT

Background: Occupation remains an unmet need in long-term dementia care. To increase residents' occupation, knowledge of types of occupation related to wellbeing, and organizational and environmental characteristics encouraging involvement in these types of occupation, is indispensable.

Methods: In this explorative study, Dementia Care Mapping was used to study involvement in different types of occupation and wellbeing among 57 residents of 10 dementia care facilities. For each type of occupation, mean experienced wellbeing was studied. Occupation types with high mean wellbeing scores were classified as "wellbeing-enhancing occupation." Care facilities were ranked according to the mean time residents spent in types of wellbeing-enhancing occupation. Using information on staff-to-resident ratio, individual space, and items of the Physical Environment Evaluation Component of Dementia Care Mapping, organizational and environmental characteristics of the facilities were compared to study their relationship with wellbeing-enhancing occupation.

Results: Reminiscence, leisure, expression, and vocational occupation had greatest potential to enhance well-being, but these types were seldom offered. Much variation existed in the extent to which wellbeing-enhancing occupation was provided. Long-term care facilities that did so more frequently generally had a more homelike atmosphere, supported social interaction through the environment, and had no central activity program.

Conclusions: This study suggests that it is possible to engage residents in wellbeing-enhancing occupation, within current means of budget and staff. The physical environment and care organization might play a role, but the key factor seems to equip staff with skills to integrate wellbeing-enhancing occupation into care practice.

Key words: Alzheimer's, activities, quality of life, nursing home

Introduction

Dementia has serious consequences for the quality of life of those who suffer from the syndrome, and for his or her network. Cognitive degeneration causes problems with communication, memory, planning, and motor functioning. These problems can seriously affect the fulfillment of basic psychological human needs. One of these needs is occupation (Kitwood, 1997).

Occupation has been described as "involvement in life in a way that is personally significant" (Kitwood, 1997) and "that which we seize for our own personal possession, and which engages our time, attention and environment" (Perrin *et al.*, 2008). Occupation goes beyond pure involvement in recreational activities. It can involve work, leisure, and play, but also getting up, eating and drinking, receiving physical care, sexual stimulation, interest in objects, helping others, social conversation, and so on (Elliot, 2011). People with dementia become increasingly dependent on their environment to be occupied, since they lose skills to initiate activities and increasingly need visual or verbal prompting to start occupation (Cook *et al.*, 2008). Especially in a long-term care environment where their sick role and dependency are emphasized and where it is hard to exercise autonomy, occupation can be a challenge for people with dementia (Harmer and Orrell, 2008).

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Research has shown, however, that residents with dementia still consider occupation to be important for their quality of life (Train *et al.*, 2005; Dröes *et al.*, 2006). Moreover, several studies show that occupation can have beneficial effects on the wellbeing of long-term care residents with dementia. For example, involvement in scheduled recreational activities such as games or songs was found to increase residents' positive affect or "happiness" during these activities (Schreiner *et al.*, 2005). A continuous activity program, in which long-term care residents were brought to a "club area" to be engaged in various activities during the day, was found to improve behavioral problems, decrease the use of psychotropic medication, improve nutritional status, and decrease social isolation (Vollicer *et al.*, 2006). In an intervention program called TimeSlips, where residents and staff constructed stories together once a week for one hour for ten weeks, higher engagement and alertness were found in the intervention group compared with a control group, although the intervention group also expressed higher levels of anxiety and sadness (Fritsch *et al.*, 2009). The Enriching Opportunities Program, an activity-based model of care where the capabilities and interests of residents are assessed and staff are trained to provide activities under the supervision of a specialized staff member, led to an increase in the wellbeing and diversity of activity (Brooker *et al.*, 2007). Lack of occupation, on the other hand, can result in boredom, apathy, disruptive behavior, loss of self-esteem, depression, social exclusion, and loneliness (Kolanowski *et al.*, 2006).

However, despite the fact that activity programming is evidently important to residents and is even mentioned in recent dementia care practice guidelines (e.g. Scottish Intercollegiate Guidelines Network, 2006; National Collaborating Centre for Mental Health, 2007; American Psychiatric Association, 2007), wide implementation in care practice seems to remain difficult, as illustrated by recent studies in which occupation was still found to be a large unmet need amongst long-term care residents with dementia (Orrell *et al.*, 2008; Passos *et al.*, 2012).

Several organizational and environmental factors may contribute to this problem. The most commonly used explanations for limited activity programs are limited resources in terms of staff and finances. Both care workers and family caregivers often express the need for additional staff to engage residents in meaningful occupation (Train *et al.*, 2005; Harmer and Orrell, 2008). Innes and Surr (2001) structurally observed active and inactive behavior of 76 residents with dementia over 269 hours, and found no relationship between staff ratio and the engagement of residents in occupational activity.

Another important influence of the lack of occupation might be a knowledge deficit of staff concerning what activities actually comprise occupation, and the impact these have on resident wellbeing (Innes and Surr, 2001; Harmer and Orrell, 2008). There is general consensus that occupation should contain "meaningful activities." Although attempts have been made to define meaningful occupation (e.g. "occupation that is personally significant, that gives a sense of belonging and something to do, occupation that addresses psychological and social needs"; Phinney *et al.*, 2007; Harmer and Orrell, 2008), the concept remains inexplicit, making it difficult to work with.

A first step in increasing occupation among long-term care residents might be simplifying the concept of meaningful occupation into wellbeing-enhancing occupation. This can be done by looking at which types of occupation generally lead to greater resident wellbeing. For example, it was found that work-related occupation resulted in greater engagement and longer involvement than non-work-related occupation, both in persons with moderate and severe dementia (Cohen-Mansfield *et al.*, 2010a). The researchers suggested that this finding might be explained by a lifetime exposure to office or household tasks, willingness to assist in a project, or the desire to make oneself useful. Other activities that are assumed to enhance wellbeing in long-term care residents with dementia are reminiscence, listening to music, singing, dancing, and quality interaction about family and social topics (Woods *et al.*, 2005; Harmer and Orrell, 2008). Also, creative expression, handcrafts, intellectual occupation, and exercise were found to enhance wellbeing (Innes and Surr, 2001).

An insight into wellbeing-enhancing types of occupation will help care practice to focus on what is generally important for residents. Identification also enables studying the impact of the care environment on resident occupation. For example, factors that were found to positively influence residents' occupation are the delivery of small, person-centered activities, instead of a central activity program (Train *et al.*, 2005; Vollicer *et al.*, 2006), a smaller number of residents in a care unit (Cohen-Mansfield *et al.*, 2010b), a homelike atmosphere of the common living room (Phinney *et al.*, 2007; Smit *et al.*, 2012), and visual and occupational stimuli (Elliot, 2011).

This study explores residents' involvement in different types of occupation and its relation to wellbeing, and those characteristics of care facilities that might facilitate occupation among residents. The following research questions are studied:

(1) In what types of occupation are residents of long-term dementia care facilities involved in shared living rooms, and to what extent? (2) Does involvement in certain types of occupation specifically enhance wellbeing of residents? (3) To what extent do the observed care facilities vary in the average time their observed residents are involved in wellbeing-enhancing occupation? (4) To what extent is residents' involvement in wellbeing-enhancing occupation related to organizational and environmental characteristics of the care facility?

Methods

Study design and sample

Data were derived from a sub-study of the Living Arrangements for people with Dementia (LAD) study. This is an ongoing study to monitor development and variety in Dutch nursing home care for people with dementia, and consequences of different care environments in terms of group living home care characteristics, staffing models and person-centeredness for residents' quality of life, quality of care, staff ratio, and staff wellbeing. Data collection takes place every two years. The design of the LAD study has been described in detail elsewhere (Willemse *et al.*, 2011).

In the first measurement cycle of the LAD study (2008–2009), 136 long-term care facilities for people with dementia participated. These facilities represented traditional large-scale nursing homes (n = 27), nursing home wards in homes for the aged (n = 17), and three types of group living home care facilities: (1) group living home care facilities that had 36 or more residents with dementia ("large-scale group living homes"; n = 31); (2) small-scale group living homes (defined as fewer than 36 residents with dementia) that solely provided group living home care (n = 26); and (3) small-scale group living homes that also provided other types of long-term care at the same location (n = 35). The 136 care facilities were all state financed and had a similar resident population concerning age, sex, cognitive performance, and physical functioning. However, they varied to a great extent in terms of care organization and the primary study outcomes of resident quality of life, quality of care, and staff wellbeing. To gain more in-depth insight into facilitators and barriers of high-quality dementia care, a sub-study was conducted amongst facilities rated with the best and worst performing on measures used in the original LAD study (Willemse *et al.*, 2011). Using a selection of the quantitative data of the LAD study, all 136 locations were ranked according to their scores on (1) resident wellbeing measured using quality of life (the Qualidem; Ettema *et al.*, 2007) and pain (MDS-RAI; InterRai, 2005); (2) staff wellbeing measured using job satisfaction, intention to leave (the Leiden quality of work scale; Van der Doef and Maas, 1999) and burnout complaints (Maslach Burnout inventory; Maslach and Jackson, 1986); (3) quality of care measured using person centered attitude of staff (Approach to Dementia Questionnaire; Lintern *et al.*, 2000), and clinical records of the use of physical restraints and psychotropic drugs; (4) staff-to-resident ratio. The scores on these four outcomes were transformed to percentiles and added, resulting in a "total score of success." It was aimed to select a high- and a low-scoring facility of each type of long-term dementia care facility. The selected care facilities were invited to participate in the sub-study. If they refused, the care facility within the specific type of care with the second highest or lowest score was approached. There was no "worst-performing" facility in the category "homes for the aged" willing to participate in the study. This category was filled with the inclusion of a second best practice in the small-scale care facility that solely provided group living home care, since group living home care was of primary interest of the sub-study. This procedure led to the participation of ten care facilities that are described in Table 1.

In one shared living room in every care facility, five to six residents were selected for observation to collect data on behavior, occupation, and wellbeing (n = 57). Only residents that were living in the care facility for more than one month were observed. When the observed living rooms consisted of more than six residents that resided there for over one month, the observant consulted the team manager to gather a sample of residents that represented both males and females, people with moderate and severe dementia, and expressed different levels of disruptive behavior to obtain a representative sample of an average nursing home population. Prior to observation, informed consent was given by the primary family caregivers of the observed residents.

Measures

Occupation and wellbeing of residents

As observation tool, the eighth edition of Dementia Care Mapping (DCM) was used (Bradford Dementia Group, 2005; Brooker and Surr, 2006). DCM is a system for structurally examining components of behavior and quality of life of residents of dementia care settings. While it was originally developed as a tool to evaluate and improve quality of care in long-term dementia

Table 1. Description of participating facilities (n = 10)

NO	CARE TYPE	BEST/WORST PRACTICE AND SCORE ON SUCCESS	DESCRIPTION
1	Traditional large-scale nursing home	Worst practice −8.67	Nursing home with 119 residents with dementia divided over four wards, with separate living rooms for approximately 11 residents per living room. In other departments of the facility also live residents with other care needs. The nursing home is located in a rural area, with a large terrace and garden.
2	Traditional large-scale nursing home	Best practice 2.0	Nursing home with ten floors with six wards for people with dementia (144 residents in total) and six wards for people with somatic problems (144 in total). On each ward live 24 residents, sitting in two living rooms during the day (12 residents each).
3	Nursing home ward in a home for the aged	Best practice 4.67	Dementia care unit in home for the aged with 23 residents, divided over two living rooms of 11/12 residents each, located in a small city, with balcony.
4	Care facility with 36 or more residents, where group living home care is provided	Best practice 10.0	Care facility with 90 residents in total, with 15 apartments for 6 residents with dementia each, divided between two floors, nearby a large living facility for older people in a city, with garden and balcony.
5	Care facility with 36 or more residents, where group living home care is provided	Worst practice −3.67	Care facility with two wards on the ground and first floor of a combined nursing home/home for the aged, residing 24 people with dementia per ward, divided in two living rooms for 12 residents.
6	Care facility with less than 36 residents, where group living home care is provided next to other types of care	Worst practice −8.67	Care facility for 24 people with dementia, with three apartments of 8 residents each. The arrangement is attached to a home for the aged, and is located in a rural area.
7	Care facility with less than 36 residents, where group living home care is provided next to other types of care	Best practice 9.33	A care farm with 18 residents with dementia living in three houses (six residents each) and 12 residents with mental disorders, living in three houses (four people each). The care facility is surrounded by a large amount of farmland and located in a rural area.
8	Care facility with less than 36 residents, where solely group living home care for people with dementia is provided	Worst practice −1.67	Care facility containing four apartments situated on four floors with six residents each (24 residents with dementia in total), in a big city, with garden on the ground floor.
9	Care facility with less than 36 residents, where group living home care is provided next to other types of care	Best practice 11.67	A care facility with one apartment for six residents with dementia, and one for six residents with somatic complaints on the ground floor with garden in a middle-sized city.
10	Care facility with less than 36 residents, where solely group living home care for people with dementia is provided	Best practice 8.67	Care facility with 20 residents with dementia, living in three apartments of seven and six residents.

care, it has gained popularity as a research tool. Usually, DCM involves six continuous hours of observation, during which a trained observant (mapper) follows five to eight people over 5-minute intervals (Brooker, 2005; Sloane *et al.*, 2007). For the current study, DCM was performed during two periods of three hours in each facility for the purpose of including mealtimes in the observations. The organization of mealtimes was theorized to be a determining factor for good

Table 2. Overview of the time involved in types of occupation and mean wellbeing during occupation (n = 57)

BEHAVIOR CATEGORY CODES	MEAN % OF TIMEFRAMES INVOLVED IN OCCUPATION (SD)	MEAN WELLBEING DURING OCCUPATION (SD)
Articulation – interaction with others	17.62 (14.9)	1.29 (0.52)
Borderline – being passively involved	18.39 (12.40)	0.99 (0.92)
Cool – being withdrawn	1.30 (3.42)	− 0.83 (0.58)
Doing for self – doing self-care	3.35 (5.15)	0.99 (0.17)
Expressive – expressive activities	0.86 (2.31)	1.89 (0.91)
Food – involved in eating and drinking	20.48 (8.62)	1.38 (0.58)
Going back – reminiscence	0.47 (1.12)	2.18 (0.77)
Intellectual – involved in intellectual activities like games	0.05 (0.41)	3.00 (–)
Joints – involved in physical activity	0	–
Kum and go – walking around, move	2.62 (5.54)	1.04 (0.71)
Leisure – involved in leisure activities	8.42 (14.37)	1.80 (0.72)
Nod – sleeping, dozing	13.05 (18.62)	0.72 (0.62)
Objects – having attention to lifeless objects	1.14 (2.44)	0.78 (0.61)
Physical – receiving physical care	1.87 (2.20)	1.13 (0.55)
Religion – involved in religious activities	0.17 (0.49)	1.33 (0.82)
Sexual expression	0	–
Timalation – direct involvement of senses, feelings	1.30 (4.71)	1.00 (0.43)
Unresponded to – trying to communicate but getting no response	0.76 (3.86)	− 0.67 (1.51)
Vocational – task related activities	2.32 (5.34)	1.66 (0.87)
Withstanding – repeated self-stimulation	2.65 (10.20)	0.30 (0.83)
X-cretion – involved in activity around excretion	1.03 (2.20)	1.28 (0.44)
Yourself – talking to oneself	2.20 (8.04)	0.78 (0.38)
Zero option – none of the above stated categories	–	–

The bold words are the codes that are given to each type of occupation (ranging from A to Z) during Dementia Care Mapping. After these words, a description is given on that type of occupation.

dementia care, since in some care facilities meals were prepared in the kitchen of the shared living room, creating the opportunity for activities and social interaction. During each 5-minute interval at which the residents were observed, the dominant occupation of the residents was coded in one of 23 behavior category codes (BCCs), which are presented in Table 2. At the same time that BCCs were given to occupation of residents, their wellbeing was observed by ranking ill-being or wellbeing values that are rated on a six-point scale. A value of −5, −3, and −1 represents levels of ill-being, 1 is the neutral value, and +3 and +5 represent wellbeing.

Organizational and environmental characteristics of care facilities

To study the influence of characteristics of the care organization and individual space of residents, data of the larger LAD study dataset were used (Willemse *et al.*, 2011). Data on staff-to-resident ratio were derived from the working schedules of the care facilities. Data concerning the presence of a central activity program and the number of residents were derived from structured interviews with care managers. The size of the common living rooms was measured by research assistants.

To study the possible relationship between wellbeing-enhancing occupation and environmental characteristics of long-term care facilities, items of the physical environment evaluation component of DCM were measured (PEEC-DCM; Chaudhury *et al.*, 2013). This tool is currently under development to form an environmental supplement to DCM. For the current paper, the domains "continuity of the self," "social interaction," and "stimulation" of the PEEC-DCM were studied, since these were theoretically assumed to enhance occupation. The domains respectively represent characteristics that help preserve or support residents' past activities and preferences; characteristics that facilitate and enable meaningful interaction with others (i.e. resident–resident, resident–staff, resident–family); and characteristics that contribute to an appropriate quantity and quality of sensory experience (Chaudhury *et al.*, 2013).

Box 1. Environmental characteristics inventoried in each care facility, based on three domains of the Physical Environment Evaluation Component of Dementia Care Mapping (Chaudhury *et al.*, 2013).

Please explain the answers to the items beneath

Continuity

1. Homelike décor and furniture in terms of colors, carpet, walls, tables, chairs, cabinets, lamps *yes, partly, no*
2. Presence of outdoor space *yes, partly, no*
3. Presence of walking path *yes, partly, no*

Both continuity and social interaction

4. Presence of occupational stimuli like books, papers, magazines, games, stuffed animals *yes, partly, no*
5. Presence of meaningful objects (objects that have potential value to residents) *yes, partly, no*

Social interaction

6. Presence of separate seatings on care unit outside the living room *yes, partly, no*
7. Furniture is arranged in conversational pattern (stimulating social interaction) *yes, partly, no*

Both social interaction and stimulation

8. Visual stimuli: decoration of the wall, photographs, mobiles, fish tank *yes, partly, no*

Stimulation

9. Presence of blinding glare on floors, furniture *yes, partly, no*
10. Enough daylight *yes, neutral, no*
11. Sound: TV, radio, shouting residents, shouting staff, dish washer *pleasant, neutral, noisy*
12. Smell *pleasant, neutral, smelly*

Since the complete tool was still under development at the time of the study, the mapper observed the characteristics once only in every care facility, instead of observing the environment in relation to the residents during the 5-minute interval observations. The mappers were instructed to explain their answers to the questions that required interpretation, so that the research team was able to check whether the answers to the questions were uniform. The used items of the PEEC-DCM and the mapper's instructions are presented in Box 1.

Analysis

For statistical analysis, the DCM data of the observed timeframes and attached behavior code categories and wellbeing were entered into SPSS version 19. To answer the first research question, the mean percentage of timeframes that all residents were involved in the different occupation types was calculated, as well as the standard deviations. The relationship with type of occupation and wellbeing (second research question) was studied by computing the average wellbeing value during involvement in the specific type of occupation. Concerning the third research question, those occupation types on which the average wellbeing value of residents was 1.5 points or higher were defined as "occupation types that enhanced wellbeing of residents." The cut-off point of 1.5 was chosen in accordance with the cut-off points described by Fossey *et al.* (2002) in their study on the psychometric properties on DCM, in which they proposed that a mean wellbeing score of 1.5 or higher represents good to excellent wellbeing, whereas a score of 0.9–1.4 represents "fair" wellbeing, and a score below 0.9 represents low wellbeing in DCM. For all participating care facilities, an "enhancing occupation score" was calculated, representing the average time their observed residents were dominantly involved in one of the occupation types that corresponded with high levels of wellbeing. To answer the last research question, the participating care facilities were ranked according to their enhancing occupation scores, along with an overview of their organizational and environmental characteristics as observed by the mappers. The characteristics of the two highest and lowest scoring facilities were compared, to see if they prominently differed and might play a role in engaging residents in wellbeing-enhancing occupation.

Results

Resident characteristics

A total of 87.7% of the observed residents were female. The mean wellbeing score of residents was 1.17 (SD = 0.48), representing neutral or "fair" wellbeing.

Involvement in different types of occupation

In Table 2, the percentage of observed timeframes that the study sample of 57 residents were involved in the different BCCs is presented. All types of occupation, except for physical exercise ("joints"), sexual expression, and behavior that was not represented in DCM codes ("zero option") were observed. Involvement in intellectual occupation was observed only for one timeframe.

Residents were mostly involved in eating and drinking (20.48% of the observed time), followed by being passively involved (18.39%), indicating that they were observing but not actively engaged. Other common behaviors were interaction with other residents, care staff or visitors, and sleeping

Table 3. Involvement of observed residents per care facility in types of occupation that are related to high wellbeing (n = 57)

	PERCENTAGE OF TIMEFRAMES INVOLVED IN WELLBEING-ENHANCING OCCUPATION			
CARE FACILITY	MIN	MAX	MEAN	SD
1 (n = 6)	0	45.20	11.93	18.62
2 (n = 6)	0	20.70	4.05	8.21
3 (n = 5)	0	52.30	13.20	22.09
4 (n = 6)	0	37.70	11.54	17.00
5 (n = 6)	0	4.20	0.70	1.71
6 (n = 6)	0	63.90	22.50	23.89
7 (n = 6)	13.0	43.40	28.92	10.44
8 (n = 5)	0	29.90	7.18	12.79
9 (n = 6)	0	17.20	6.41	6.99
10 (n = 6)	0	29.40	14.08	11.23

or dozing. In 8% of the observed time, residents were involved in leisure activities such as reading and looking in magazines, listening to the radio, or watching TV. Other types of occupation were far less present during the observations.

Occupation types and wellbeing

Examining mean wellbeing values experienced during different types of occupation, a fair mean wellbeing level (mean value of 0.9–1.4) was observed during interaction with others, doing self-care, eating and drinking, walking around, receiving physical care, religious activities, involvement of senses, and excretion (leaving the living room to go to the restroom). High mean wellbeing values (+1.5) were recorded during expressive, reminiscence, intellectual, and vocational occupation.

Enhancing occupation in care facilities

Wellbeing was enhanced during reminiscence, expressive activities, leisure activities, and vocational occupation and were labeled as "enhancing occupation." Intellectual activities were excluded since they were only observed once. Table 3 presents the minimum, maximum, and average percentages of timeframes that residents within the ten care facilities were involved in any of the enhancing occupation types including standard deviations. Large variation exists in the average enhancing occupation of residents between care facilities.

Organizational and environmental characteristics and enhancing occupation

In Table 4, the care facilities are presented in order of the mean percentage of timeframes that their residents were involved in enhancing occupation, and their organizational and environmental characteristics. When looking at the two highest (facilities 6 and 7) and lowest (facilities 5 and 2) scoring facilities, few characteristics seem to be of importance concerning enhancing occupation in long-term dementia care. In particular, there seems to be no relationship between wellbeing-enhancing occupation and staff-to-resident ratio, as pointed out by the average staff ratio of the facility rated highest on wellbeing-enhancing occupation, and the average rating of facility 3 that had lowest staff ratio.

The absence of a central activity program – in other words, activities were not primarily offered outside the care units and performed by specialized care workers on a fixed week schedule – did seem to be a potential contributor to engagement in enhancing occupation offered in the shared living room, as did two environmental characteristics derived from the Physical Environment Evaluation Component of DCM: a homelike, non-institutional interior (domain of continuity), and an interior that stimulates interaction (domain of social interaction).

Discussion

This explorative study shows differences between types of occupation in their potential to enhance wellbeing of people with dementia and in the extent to which these types of occupation are offered, and sheds light on some potential contributors to enhancing occupation. In our sample, reminiscence, leisure, expression, and vocational occupation seem to be of greater value for residents' wellbeing than other types of occupation. Unfortunately, these wellbeing-enhancing occupation types were rarely offered – less than 5% of the timeframes on average – to the observed residents. There was much variation found between care facilities participating in this study in engaging the observed residents in enhancing occupation. However, in one facility residents were engaged in enhancing occupation during 25% of the observed timeframes on average, in another facility this was only during less than 1% of the timeframes. Facilities that engaged their residents in enhancing occupation on a frequent basis more often had a homelike atmosphere, supported social interaction through the environment, and did not have a central activity program.

Table 4. Characteristics that potentially contribute to wellbeing-enhancing types of occupation of ranked care facilities

	CARE ORGANIZATION		INDIVIDUAL SPACE		CONTINUITY			CONTINUITY AND SOCIAL INTERACTION		SOCIAL INTERACTION		SOCIAL INTER/ STIMULATION	STIMULATION			
CARE FACILITY	STAFF RATIO (HOURS/WEEK/RES)	CENTRAL ACTIVITY PROGRAM	NO. OF RESIDENTS/ LIVING ROOM	M^2 PER RESIDENT	HOMELIKE INTERIOR	WALKING PATH	OUTDOOR SPACE	MEANINGFUL OBJECTS	OCCUPATIONAL STIMULI	SEPARATE SEATINGS	INTERIOR STIMULATES INTERACTION	VISUAL STIMULI	SOUND	SMELL	DAYLIGHT	GLARE
7	18.67	No	6	8.50	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Pleasant	Pleasant	Yes	No
6	20.49	No	8	8.33	Yes	No	Yes	Yes	Partly	Yes	Yes	Yes	Neutral	Pleasant	Yes	No
10	21.60	No	7	10.00	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Pleasant	Pleasant	Yes	No
3	14.91	No	11	9.09	No	No	Yes	Yes	No	Yes	Partly	Yes	Noisy	Neutral	Yes	No
1	23.17	Yes	11	6.36	Yes	Yes	Yes	Yes	No	No	Yes	No	Noisy	Pleasant	Yes	No
4	24.28	Yes	6	10.5	Yes	No	Yes	No	Partly	Yes	Yes	Yes	Neutral	Pleasant	Yes	No
8	18.67	No	6	5.33	Yes	No	No	Partly	No	No	Yes	Yes	Noisy	Pleasant	No	No
9	17.86	No	6	13.7	No	No	Yes	Yes	No	Yes	Partly	No	Pleasant	Pleasant	Yes	No
2	21.63	Yes	12	5.91	No	No	No	Yes	Yes	Yes	No	Yes	Noisy	Neutral	Yes	A little
5	15.90	Yes	11	6.15	No	No	Yes	Yes	No	Partly	No	Yes	Neutral	Neutral	Yes	No

The findings on wellbeing-enhancing types of occupation are generally consistent with the literature. Especially reminiscence, expressive, and vocational activities were described to have positive effects on mood, engagement, and sometimes even on cognition and behavior in previous research (Innes and Surr, 2001; Woods *et al.*, 2005; Harmer and Orrell, 2008; Cohen-Mansfield *et al.,* 2010a). Leisure activities, which contained activities such as looking at magazines, reading, or knitting in this study, are not frequently mentioned in the literature as a type of wellbeing-enhancing occupation, possibly because they are often not recognized as an activity. Physical exercise, a type of occupation that is described to positively influence wellbeing (Williams and Tappen, 2007) and which was found to lead to highest mean wellbeing scores in other DCM research (Innes and Surr, 2001), was not observed during this study, so no conclusions can be drawn considering its impact on wellbeing. This might be explained by the fact that we observed in residents' common living rooms. Involvement in intellectual activities was only observed once, so no conclusions can be drawn for this type of occupation.

Interaction was not found to be a wellbeing-enhancing type of occupation. This might be explained by the quality of interaction. Interaction was rated when residents talked to other residents, care workers, or family for the greater part of a timeframe, but could contain neutral, positive or negative interaction. As Harmer and Orrell (2008) reported, interaction might be only beneficial when it is of good quality. This illustrates the importance of the actual content of a type of occupation.

Consistent with the DCM study of Innes and Surr (2001), the staff ratio was not found to be clearly related with time spent in wellbeing-enhancing occupation in this study and, therefore, seems to be no explanation for low occupation of residents in long-term dementia care facilities, as assumed in some earlier studies (Train *et al.*, 2005; Harmer and Orrell, 2008). This suggests that occupation of residents depends on how care workers use the available time and how staff are equipped to engage residents in wellbeing-enhancing occupation. Findings from Smith *et al.* (2010) suggest that staff training in involving residents by using the daily environment significantly increases occupation, also on the long term, without increasing the number of staff.

Our study findings suggest that the presence of a central activity program does not necessarily have to decrease involvement in enhancing types of occupation as long as it is offered on a complementary basis. In one of the observed facilities in this study, the central program clearly was an extra service for residents, in addition to the provision of occupation in the shared living rooms. However, in the other three with a central activity program, only a few residents were involved during the observation period, leaving remaining residents generally unoccupied. These findings are consistent with findings of Vollicer *et al.* (2006), who assumed that the presence of a central activity program decreases the involvement in meaningful occupation. Also, for residents that are regularly involved in central activities, the sole provision of a central activity program might not meet the specific needs of long-term care residents. Knight and Mellor (2007) pointed out that a central activity program for long-term care residents can emphasize their feelings of living in an institution instead of at home, and may facilitate only superficial interaction with other residents, although residents with dementia were excluded in this study.

Concerning individual space, the number of residents per living room and the size of the living rooms did not seem to make that much of a difference in terms of involvement in wellbeing-enhancing occupation. This conflicts with the findings that limiting numbers to between four and nine people optimizes engagement in activities (Cohen-Mansfield *et al.*, 2010a). However, there could have been too little variation in the size of resident groups in the current study to find a relationship, and this might also be dependent on the type of residents and the type of occupation they need.

No relationship was found between occupational and visual stimuli and the provision of wellbeing-enhancing occupation. This is in accordance with the findings of Wood *et al.* (2005), who found that the mere presence of stimuli does not automatically mean that residents were involved in activities due to their loss of skills to initiate activities. They have to be actively engaged to be occupied. In our study, sound did not clearly seem to affect involvement of residents in enhancing types of occupation, as was found in earlier research (Cohen-Mansfield *et al.,* 2010b).

This study has some methodological limitations and strengths. This study is explorative in nature and not meant to represent daily practice of the participating care facilities, let alone nursing homes in general. Only a small sample of residents ($n = 57$) and living arrangements ($n = 10$) participated in this study. Our observations were done in two shifts of three hours, observing at least two different care workers per facility. Still, the observations could have been biased by the care workers present during observations. Also, the presence of the dementia care mapper might have influenced the study data, although it was tried to limit this bias by informing

staff that we observed interaction and behavior, but not about the exact research questions on occupation and wellbeing. If study results are biased by this cause however, it is likely that this would have led to an overestimation of occupation of residents since staff would have wanted to perform better than usual, making our findings of low occupation even more distressing.

The fact that our observations covered the mealtimes of residents might have led to a bias in average time and types of occupation. Probably, residents would have spent more time in other types of occupation in other observation times than they did now since they would probably be less involved in eating and drinking. The time of the day can also influence mood and behavior of people with dementia. On the other hand, the mean time that residents were observed to be engaged in different types of occupation resembles observations of other studies using DCM (Sloane *et al.*, 2007). A longer observation period would have limited the potential biases mentioned above.

DCM is sometimes questioned as a research tool since it was primarily developed to evaluate and improve care practice. Although the observation technique is standardized and performed by trained observers, it has certain psychometric limitations, such as low variability and low inter-rater reliability in the wellbeing code (Sloane *et al.*, 2007). Despite these limitations, with the DCM tool, behavior and wellbeing can be measured simultaneously, enabling the study of the relationship between both in detail.

In this study, environmental characteristics were studied with the use of items of the physical evaluation component of DCM (Chaudhury *et al.*, 2013). While this tool was still in development at the time of the data collection of this study, it was only used to observe the environment once by the dementia care mapper, instead of structurally inventorying the influence of the physical context alongside observations. Thus, although the items used in this study are evidence based, the way data on characteristics were collected leaves them open for interpretation, making the data of limited reliability.

Another limitation is the absence of objective data on the observed residents concerning age, stage of dementia, functional status, and disruptive behavior. Although all residents had to have moderate-to-severe dementia needing 24-hour care and assistance with their activities of daily living, since these are strict criteria for receiving the type of care subject of this study, residents had individual differences in their behavior and dependency that probably influenced our study data. Subjective statements of the mappers suggested that residents with lower cognitive and functional status were occupied less often than residents with higher functioning levels, as is also indicated in several studies on factors that influence occupation of residents (Kuhn *et al.*, 2004; Dobbs *et al.,* 2005; Kolanowski *et al.*, 2006; Smit *et al.*, 2012). Standardized data on these characteristics would have provided more insight into this relationship.

Despite the explorative character of this study with accompanying limitations, its results have important implications for care practice. They show that it is possible to engage residents in wellbeing-enhancing types of occupation, and to do so within current means of budget and staff. They also show that the environment might have some influence on activity participation. The next step would be to translate these group results back to the individual resident, with its own preferences and needs. Further research is needed to study which mechanisms cause certain types of activities to be of greater value, or of greater meaning, than others so that care workers can apply this knowledge when making care plans for and preferably with residents. The same holds true for the impact of the environment on resident occupation. For example, does a homelike environment create more opportunities to involve residents in wellbeing-enhancing occupation, or is "feeling at home" of vital importance to enjoy activities? Understanding what makes activities meaningful, and eventually how to involve each unique resident in meaningful occupation, is the key factor for its increase. In order to reach this, it is essential to put wellbeing-enhancing occupation on the care facility's agenda, to evaluate the contribution of the organizational and physical environment, and to enable care staff to acquire skills to integrate wellbeing-enhancing occupation in practice and to adjust these types of occupation to the individual interests, needs, and abilities of residents.

Conflict of interest

None.

Description of authors' roles

Dieneke Smit analyzed the data and drafted the paper. Bernadette Willemse helped in analyzing the data and helped to draft the paper as did Jacomine de Lange. Anne Margriet Pot helped to draft the paper, checked the analyses, and is principal investigator of the LAD study. All authors contributed to the design of the LAD study. All

authors read and approved the final paper for publication.

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